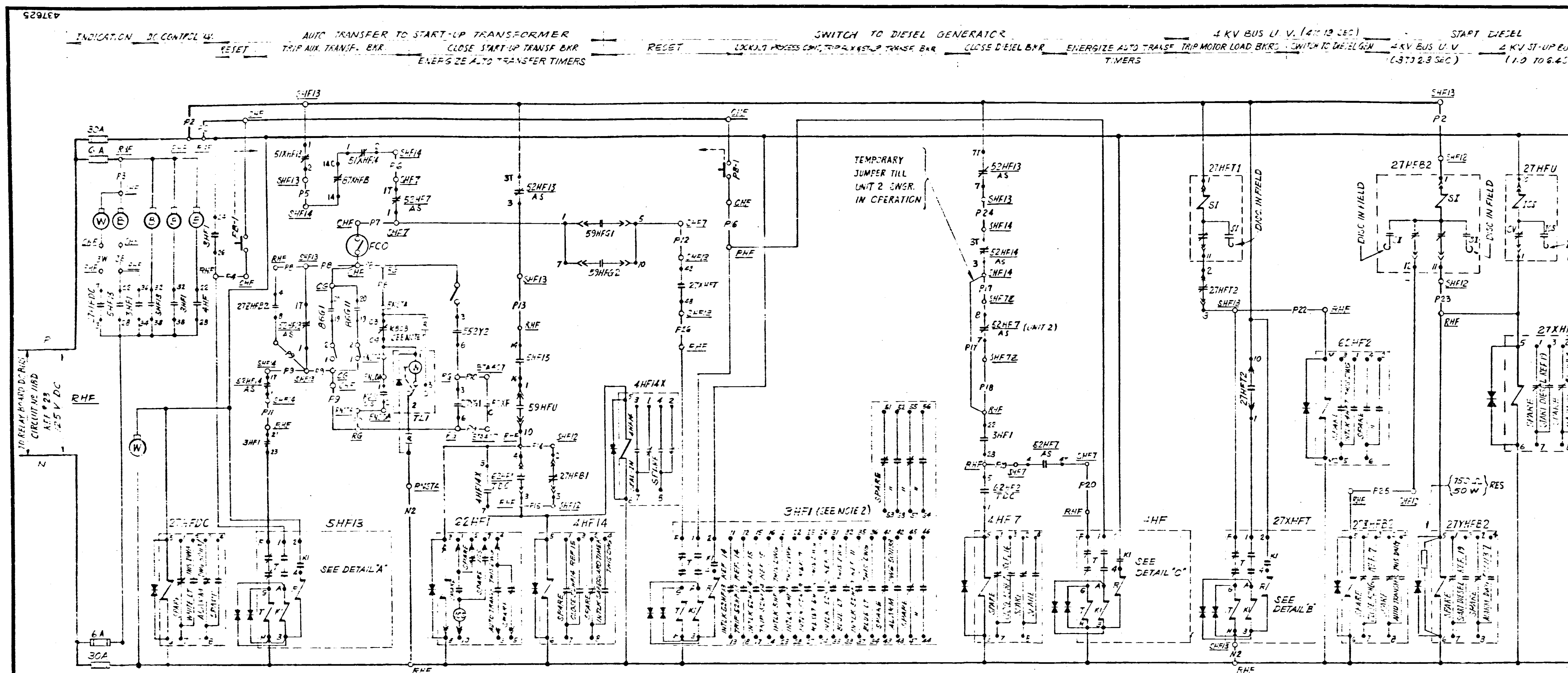
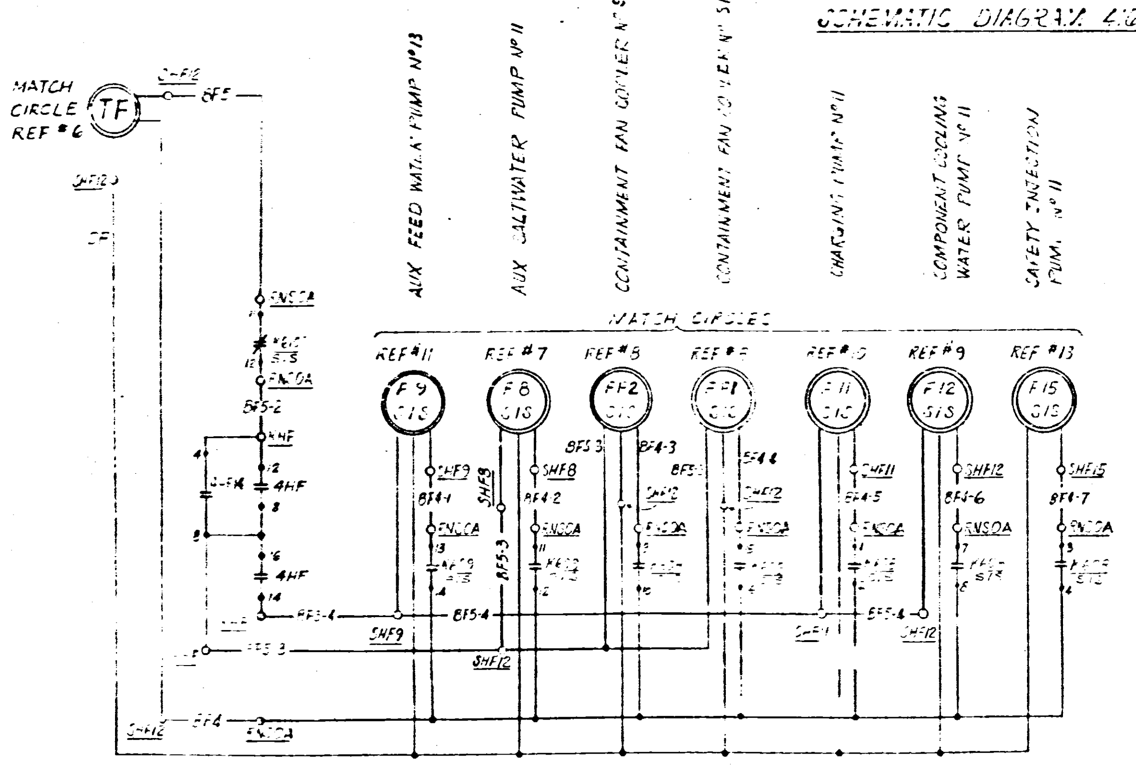


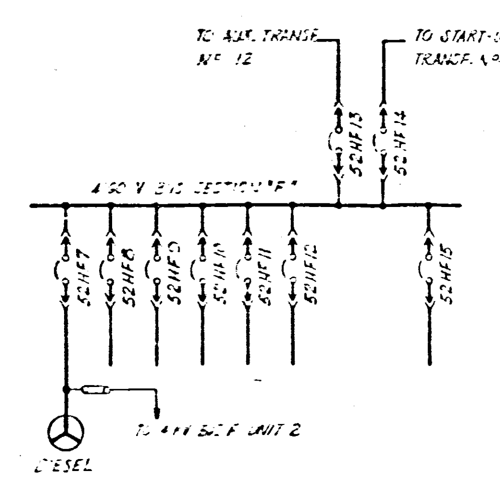
SCHEMATIC DIAGRAM 4160 V BUS SECTION "F" AUTOMATIC TRANSFER CKT. NO. FATH



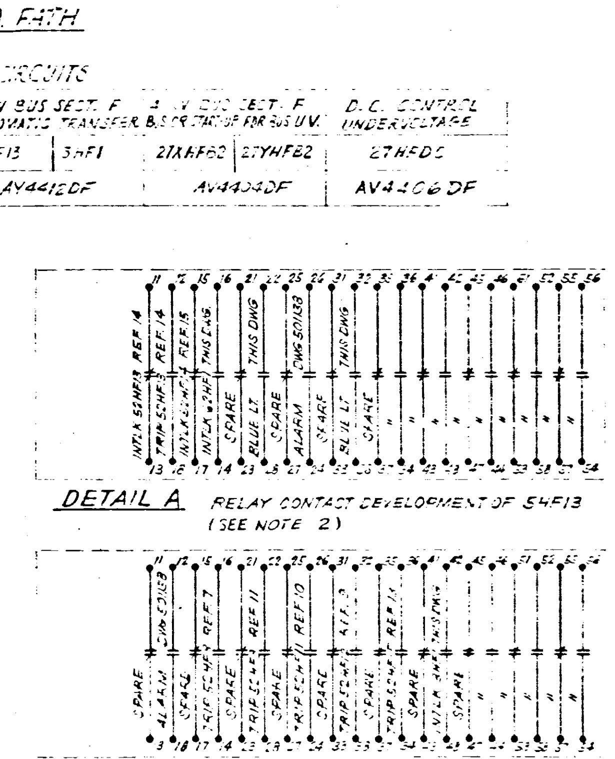
POTENTIAL FOR AUTO TRANSFER AND ENGINEERED SAFE-GUARD TIMERS
CKT. NO. FATH

ALARM CIRCUITS

	4 KV BUS SECT. F UNDERVOLTAGE	4 KV BUS SECT. F AUTOMATIC TRANSFER		4 KV BUS SECT. F B.S. OR START-UP FOR BUS U.V.		D.C. CONTROL UNDERVOLTAGE
DEVICE	27XHFT	5HF13	3HF1	27XHFB2	27YHFB2	27HFDC
CKT. No	AV4403DF	AY4412DF		AV4404DF		AV4406DF

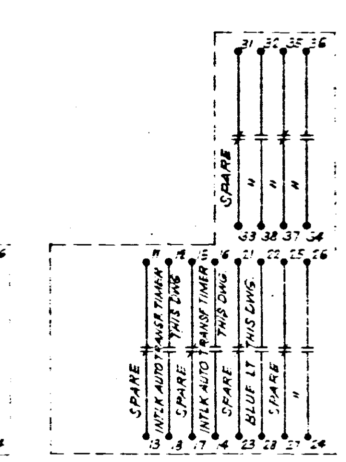


PARTIAL SINGLE LINE DIAGRAM BUS SECTION "F"



DETAIL A RELAY CONTACT DEVELOPMENT OF 5HF13 (SEE NOTE 2)

DETAIL B RELAY CONTACT DEVELOPMENT OF 27XHFT (SEE NOTE 2)



DETAIL C RELAY CONTACT DEVELOPMENT OF 4HF (SEE NOTE 2)

TABLE OF DEVICES

DEVICE No	FUNCTION	RATING OR RANGE	MFR.	TYPE	CAT. NO. OR REF. DWG	REMARKS
3HF1	DIESEL AUTO TRANSFER INTERLOCKING RELAY	125 VDC	ELECTRO SWITCH	LOR SERIES	7826CD	ELECTRIC RESET
4HF	DIESEL AUTO TRANSFER CONTROL RELAY		ELECTRO SWITCH	LOR SERIES	7823CD	" "
4HF7	DIESEL AUTO TRANSFER CLOSE RELAY		W	SG	1342125	
4HF14	START-UP AUTO TRANSFER CLOSE RELAY		W	SG	1342125	
5HF13	START-UP AUTO TRANSFER TRIP RELAY		ELECTRO SWITCH	LOR SERIES 24	7825CD	ELECTRIC RESET
27HFDC	DC CONTROL BUS UNDERVOLTAGE RELAY		W	SG	1342125	
27HFB1	4 KV BUS F AUTO TRANSFER UNDERVOLTAGE RELAY	—	—		(2 & 6)	INSTANTANEOUS VOLTAGE DECAY
27HFB2	4 KV BUS F START DIESEL UNDERVOLTAGE RELAY	—	—		(2 & 6)	3.0 SEC TO 0 ZERO VOLTS WITH 1 TIME DIAL SETTING
27XHFB2	4 KV BUS F START DIESEL UNDERVOLTAGE AUX. RELAY	125 VDC	W	SG	1342125	
27YHFB2	4 KV BUS F START DIESEL UNDERVOLTAGE AUX RELAY		W	SG	1342125	
27HFT1	4 KV BUS F UNDERVOLTAGE TRIP RELAY	—	—	—	(2 & 6)	4 SEC TO 0 ZERO VOLTS WITH 1 TIME DIAL SETTING
27HFT2	4 KV BUS F UNDERVOLTAGE TRIP RELAY	—	—	—	(2 & 6)	INSTANTANEOUS
27HFU	4 KV BUS F UNDERVOLTAGE RELAY (TRIP RANGE)	—	—	—	(2 & 6)	1.0 SEC TO 0 ZERO VOLTS WITH 1 TIME DIAL SETTING
4HF14X	START UP AUTO TRANS CLOSE AUX RELAY	125 VDC	W	SG	1342125	
27XHFT	4 KV BUS UNDERVOLTAGE TRIP AUX. RELAY	125 VDC	ELECTRO SWITCH	LOR SERIES 24	7825CD	ELECTRIC RESET
27ZHFB2	4 KV BUS F START DIESEL U/V AUX. RELAY		W	SG	1342125	
27Y-G1	GENERATOR UNDERVOLTAGE AUX. RELAY	—	—	—	(17)	
51XHF13	4 KV BUS F FOR OC AUX RELAY (AUX. TRANSFORMER)	—	—	—	(4)	
51XHF14	4 KV BUS F FOR OC AUX RELAY (START UP TRANSFORMER)	—	—	—	(5)	
52HF7	4 KV BUS F FOR CKT BKR DIESEL GENERATOR	—	—	—	(2)	
52HF13	4 KV BUS F FOR CKT BKR AUX TRANSFORMER	—	—	—	(2)	
52HF14	4 KV BUS F FOR CKT BKR (START UP TRANSFORMER)	—	—	—	(2)	
59HFU	4 KV BUS F FOR O/V RELAY (START UP TRANSFORMER)	—	—	—	(2 & 6)	INSTANTANEOUS
59HFG1	4 KV BUS F FOR O/V RELAY (DIESEL GENERATOR)	—	—	—	(2 & 6)	"
59HFG2	4 KV BUS F FOR O/V RELAY (DIESEL GENERATOR)	—	—	—	(2 & 6)	"
62HF1	START-UP AUTO TRANSFER TIMER BUS F	48/125 DC	W	TDS	293B301A15	0.2 TO 4 SEC.
62HF2	DIESEL AUTO TRANSFER TIMER BUS F	120 V. D.C.	AGASTAT	SER. 2400	2412PB	0.2 TO 5 SEC.
86G1	UNIT TRIP LOCKOUT RELAY	—	—	—	(17)	
86G11		—	—	—	(13)	
87XHFB	4 KV BUS F DIFF. AUX. RELAY	—	—	—	(2)	
552Y2-1	500 KV R.C.B. AUX. RELAY	—	—	—	(8)	CONTACT IS CLOSED WHEN 500 KV BKRS ARE OPEN
33XF	25 KV MOTOR OP. DISC. AUX. SW.	—	—	—	(20)	CONTACT IS CLOSED WHEN DISC. SW IS OPEN
K608/SIS	SAFETY INJECTION AUX RELAY	—	—	—	(26 & 27)	
K609/SIS		—	—	—	(26 & 27)	
K610/SIS		—	—	—	(26 & 27)	
K611/SIS		—	—	—	(26 & 27)	

NOTES
1 TEST RELAY CONTACT OPEN DURING TEST
2 CONTACTS ARE SHOWN IN RESET POSITION

EQUIPMENT LOCATION

ETH106	TERMINAL BOX H106
SHF7Z	SWGR 4KV BUS F CUBICLE 7 - UNIT 2
RHF	ENG SAFEGUARD RELAY BOARD BUS F
CHF	CONTROL BOARD ENG SAFEGUARD BUS F
CG	CONTROL BOARD MAIN GENERATOR
RG	GENERATOR RELAY BOARD
SHF7	SWGR 4KV BUS F CUBICLE 7
RNSOA	RACK NU SAFEGD OUTPUT A
ETA407	TERM BOX A407 FOR DEVICE 59/F
RNSTA	RACK NU SAFEGD. TEST A

REFERENCES
1. DESCRIPTION OF ELECT. SCHEMATIC DIAG. SYMBOLS & CIRCUIT DESIGNATIONS — DWG No 050023
2. SINGLE LINE METER & RELAY DIAG. 4160 V SYSTEM (BUS SECT. F, G & H) — 437533
3. SCHEMATIC DIAG. 4 KV SYSTEM AUTOMATIC TRANSFER BUS SECT. D & E — 437234
4. (BUS SECT. G) — 437622
5. (BUS SECT. H) — 437627
6. 4 KV BUS POTENTIAL & SYNCHRONIZING BUS SECT. F, G & H — 437614
7. AUX. SALT WATER PUMPS — 437594
8. CONTAINMENT FAN COOLERS — 437590
9. COMPONENT COOLING WATER PUMPS — 437593
10. CHARGING PUMPS — 437595
11. AUX FEEDWATER PUMPS — 437593
12. 4160 V BUS DIFFERENTIAL — 437617
13. SAFETY INJECTION PUMPS — 437599
14. AUX. TRANSFORMER No 12 & ASSOCIATED CKT BKRS, SH 2 — 437464
15. START-UP TRANSFORMER No 12 & ASSOCIATED CKT BKRS, SH 2 — 437121
16. DIESEL GENERATORS & ASSOCIATED CKT BKRS, SH 2 — 437466
17. GENERATOR CONTROL SHEET No 1 — 431557
18. GENERATOR CONTROL SHEET No 2 — 437558
19. 4KV DIESEL GENERATORS CONTROL SH 1 — 437667
20. 25KV ISOPHASE BUS MOTOR OP. DISC. SW — 437[illegible]
21. LOGIC DIAG. 4160 V BUS SECTIONS F, G & H AUTOMATIC TRANSFER — 216[illegible]
22. SCHEMATIC DIAG. MAIN ANNUNCIATOR SH. 17 & 19 — 501137 & 38
23. SINGLE LINE METER & RELAY DIAG. 125V & 250V DC SYSTEM — 437546
24. SCHEMATIC DIAG. GEN. CONTROL SHEET No 3 — 437559
25. LIST OF EQUIPMENT LOCATION CODES — DWG No 101000
26. SOLID STATE PROTECTION SYSTEM MFR DWG FEC 663231
27. FUNCTIONAL DIAGRAMS MFR DWGS FEC 663195

DESIGN CLASS 1 EQUIP

PG&E SYSTEM PHASE SEQUENCE A-C-B

REGISTERED PROFESSIONAL ENGINEER I. A. BEITENSWORTH No. 1986 ELECTRICAL STATE OF CALIFORNIA

RIM INDEXED REV. ____ UNIT 1

TABLE OF CHANGES

NO	DATE	DESCRIPTION	GM	BY	CH	APPD
11	[illegible]	CKD 59-HFU (DCR E-513)	[illegible]			
10	[illegible]	[illegible]				
9	7-13	MODIFIED AUTO TRANSF TIMERS [illegible]				
8	[illegible]	UPDATED U/V RELAYS RANGE [illegible]				
7	[illegible]	[illegible] 27HFB2				

SCHEMATIC DIAGRAM
4160 V BUS SECTION F AUTOMATIC TRANSFER
DIABLO CANYON
DEPARTMENT OF ENGINEERING
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

APPROVED BY: GM 167027
DRAWING LIST 050052
DRAWING NUMBER 437625 CHANGE 11

PG&E 30 X JAN MAR MAY JULY SEPT NOV FEB APR JUNE AUG OCT DEC 78